

LeHeR Manoeuvre in Difficult Airway Management: A Lifesaving Technique in Resource-Limited Settings

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Abstract: *In an emergency situation, endotracheal intubation is a crucial resuscitation technique. Managing the difficult airway is a great challenge not only to anaesthesiologists but also to all emergency physicians. Although there are many methods available to predict and anticipate difficult airway, however anything in emergency cannot be predicted definitely. We have discovered a brand-new, easy technique for enhancing laryngoscopic vision in challenging airways. We have described five difficult airway cases that occurred in our hospital between September 2023 and December 2023. In these cases, a straightforward technique called supine left head rotation (LeHeR) was used to achieve intubation. In all these cases, LeHeR manoeuvre has proven to be successful after many unsuccessful attempts at intubation using various other methods. This manoeuvre has shown to improve the glottic visualisation immensely making it possible to intubate patients with difficult airway with ease.*

Keywords: Endotracheal Intubation, Laryngoscopic view, Left head rotation.

1. Introduction

Tracheal intubation is an essential life-saving intervention. However, patient intubation in a difficult airway requires specialized technical skills, availability of appropriate equipment, and proper assessment of the clinical situation and priorities⁽¹⁾. In hospitals with limited advanced airway resources, managing difficult airways is a true challenge. A difficult airway is defined as “the clinical situation in which a conventionally trained anesthesiologist experiences difficulty with face mask ventilation of the upper airway, difficulty with tracheal intubation, or both (ASA Guidelines 2003)”. The incidence ranges from 0.4% to 8.5% in anaesthesia, and much higher at 2% to 14.8% in emergency medicine. Failed intubation at the emergency situations causing prolonged hypoxia might increase morbidity and mortality.^(2,3)

In an unconscious patient, the tongue's flaccid muscles cause it to fall back and obstruct the airway due to gravity. However, the supine LeHeR maneuver leverages this same principle to our advantage. By positioning the patient, we utilize gravity to shift the tongue to the left, improving laryngoscopic visibility.

- Place of Study: Department of Anesthesiology, Assam Medical College and Hospital, Dibrugarh
- Study Period: September, 2023 to December, 2023.

- Source of Data: From patients undergoing elective and emergency surgeries at operation theatres of various departments under Department of Anaesthesiology & Critical care of Assam Medical College and Hospital, Dibrugarh.
- Ethical clearance: The Institutional Ethics Committee (Human) approved this study, and each patient provided written informed consent after being fully informed about the study process in their native language.

2. Methodology

In the operating room, nil per oral status of the patient was confirmed and a 18G intravenous cannula was secured, and a multiparameter monitor was connected in order to track vital signs including heart rate, electrocardiogram, pulse oximetry, and non-invasive blood pressure.

Premedication and Preoxygenation:

All patients received premedication with intravenous injections of glycopyrrolate (0.2 mg), pantoprazole (40 mg), ondansetron (4 mg), and fentanyl (1.5-2 mcg/kg body weight) prior to induction. Preoxygenation with 100% oxygen was performed for three minutes using a clear face mask prior to proceeding with intubation in the patients and various relaxants were used according to the need of each case.



Figure 1: The steps for proceeding with LeHeR manoeuvre:

- Step 1: The patient is placed on a normal supine with head positioned in simple neck extension.
- Step 2: The head is then rotated to the left side to at least 45 degrees.
- Step 3: The laryngoscope blade is then introduced from the centre.
- Step 4: An alternative approach is to insert the laryngoscope from the right molar and slide the tongue to the left. The intubation is continued as usual from then on. ⁽⁴⁾

Intubation proceeds as usual thereafter. Rotating the neck to the left accommodates the oesophagus in its natural position, which lies left and posterior to the trachea.

While there have been many improvements in patient monitoring, airway devices, and clinical training there has been reduced the risk associated with a difficult airway, but these changes have not reduced the incidence of unexpected as well as anticipated difficult airway situations in clinical practice.

When a patient's head is turned to the left, the cricoid cartilage shifts anteriorly, compressing the esophagus and improving laryngoscopic visibility. This movement also reduces the risk of aspiration.

- In the supine position with neck extension, the cricoid cartilage and esophagus are in their normal positions.
- As the head is rotated to the left, the cricoid cartilage begins to move anteriorly.
- With the head fully rotated to the left, the cricoid cartilage compresses the esophagus, displacing it posteriorly.

Herewith, we present a case series of difficult airway scenarios managed successfully with LeHeR technique.

Case 1

A 35-year-old man who weighs 55 kg and has a physical status of II according to the American Society of Anesthesiologists was scheduled for a laparoscopic cholecystectomy having a pre-operative history of hemi-

mandibulectomy done three years prior. His mouth opening was adequate with restricted tongue protrusion, normal neck extension and 6 cm thyromental distance. General anaesthesia with video laryngoscope-assisted nasotracheal intubation was planned. The right nostril was decongested with two drops of oxymetazoline and lubricated with a dollop of 2% lidocaine jelly. The patient was premedicated with intravenous glycopyrrolate 200mcg, fentanyl 2µg/kg and midazolam 1 mg. Anaesthesia was induced with intravenous 120 mg propofol and, after ensuring mask ventilation, the patient received succinylcholine 75mg. The glottic view was unchanged even after increasing the lifting force on the video laryngoscope blade or external neck manipulations done on the patient. Then the laryngoscope blade was removed, and the LeHeR manoeuvre was performed by turning the patient's head 45° to the left side. Repeat laryngoscopy showed a much better view of the glottis. A 7.0-mm, cuffed, nasal Ring-Adair-Elwyn tube was introduced through the right nostril and advanced to the oropharynx. The trachea was intubated with the head kept in the same position following a slight medial rotation of the tube. Regular end-tidal carbon dioxide waveforms and bilateral chest rise and chest auscultation confirmed the position of the ETT. Oxygen saturation was maintained at 99%–100% during intubation.

Case 2

A 48-year-old female patient with post-burn contracture (PBC) of face, neck, and chest was posted for open cholecystectomy. She had a history of burn over the neck and chest 4 years back. Her mouth opening was less than 3 fingers breadth with a Mallampati Grading 4. The patient

had a severely restricted neck extension and flexion due to the burn contracture. The patient was premedicated with fentanyl 2 mcg/kg and midazolam 0.05 mg/kg. Anesthesia was induced with propofol 2.5 mg/kg and a size 7.5mm ETT was inserted. After confirming adequate ventilation by chest auscultation, bilateral chest rise and capnography, neuromuscular blockade was achieved with rocuronium 1mg/kg. Post the completion of surgery, the trachea was extubated after adequate reversal with intact airway reflexes.

Case 3

A 40-year-old female patient presented with complaints of oral and neck pain and difficulty in swallowing for the past 5 days. She reported with a swelling in the neck gradually increasing in size and inability to open her mouth. Additionally, she complained of difficulty in breathing when in the supine position. Her mouth opening was two finger breadth with limited neck flexion and extension. She was diagnosed to have Ludwig's angina and was posted for incision and drainage.

The patient was shifted to the operating room, given a semi-propped up position and all standard monitors were connected. Nasal decongestant drops and 2% lignocaine jelly were instilled to minimize nasal airway bleed just before the ETT was inserted. After pre-medication with glycopyrrolate 200 mcg and fentanyl 2mcg/kg patient was induced with propofol 2mg/kg.

Neuro muscular blockade was achieved by Succinylcholine 75mg and LeHeR technique was used after facing difficulty in glottis visualization post laryngoscopy. The improvement of glottic view on providing LeHeR position enabled the proper positioning of the ETT into the trachea under direct vision. The patient then underwent operation scheduled after positioning of the tube endotracheally was ascertained by bilateral chest auscultation and capnography.

The trachea was extubated after adequate reversal was confirmed.

Case 4

A 33-year-old morbidly obese man (weighing approximately 120kgs) arrived at the emergency department in acute confusional state in shock with respiratory distress secondary to severe pneumonia with a saturation of 77% on room air. There was difficulty in intubating the patient despite making several attempts by on duty resident doctors and one paramedic (with 10 years experience in emergency department) using various manoeuvres and with the aid of a stellate and bougie. The initial laryngoscopic view showed a Cormack-Lehane 3B grading. The oxygenation was maintained at 85% throughout the 30min attempt by allowing spontaneous breathing assisted by bag mask ventilation intermittently. After 30 mins of trying and failed attempts, the emergency physician was called in and supine LeHeR technique was tried. The patient was then intubated with ease as the Cormack-Lehane score improved to 1 soon after positioning of the patient.

Case 5

A 38 year old female presenting with a Large thyroid swelling though without complaints of dysphagia or dyspnea was planned for right sided hemithyroidectomy. The patient had no other co morbidities. On examination she had a

Mallampatti grading 4 with difficulty in neck extension and flexion due to the mass. The patient was then shifted to the operating room, and then direct laryngoscopy didn't give a good view of the glottis. Then the LeHeR technique was used and the view was better now, so that the intubation could be done uneventfully after induction with propofol 2mg/kg and succinylcholine 75mg provided adequate neuromuscular blockade and relaxation.

The operation was done uneventfully and patient was shifted.

3. Discussion

Patients with difficult airways are at increased risk of complications, including aspiration, esophageal intubation, and oropharyngeal trauma. Failed intubation can also lead to prolonged hypoxia, resulting in higher morbidity and mortality. To improve laryngoscopy views, various manoeuvres have been proposed, including BURP, cricoid pressure, and external laryngeal manipulation and also change over to intubation positions, such as simple neck extension and sniffing position. However, these techniques may not always be effective.

In our hospital, since resources are limited, and advanced airway management tools are scarce; in order to address these challenges, this new manoeuvre undertaken by us has enabled us to do our job easily without any compromise on the patient side and has increased chances of successful difficult intubations proving very beneficial to the patients.

4. Limitations

Being a case series, our findings are observational in nature. A randomized controlled trial with a larger sample size would provide stronger evidence on the efficacy and safety of this technique. In addition to this, the manoeuvre may not be suitable for patients with cervical spine instability or trauma.

5. Conclusion

In order to intubate patients with both anticipated as well as un-anticipated cases of difficult airway LeHeR technique has proved to be very helpful for the doctors and beneficial to the patients. This non-invasive technique, without requiring any special training or advanced airway devices has been a useful procedure in many situations.

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